

FIG. 1

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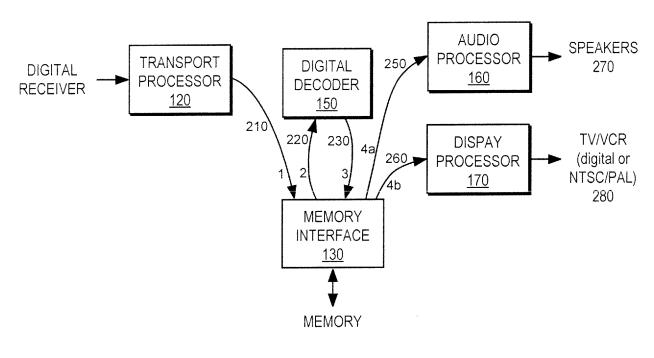


FIG. 2

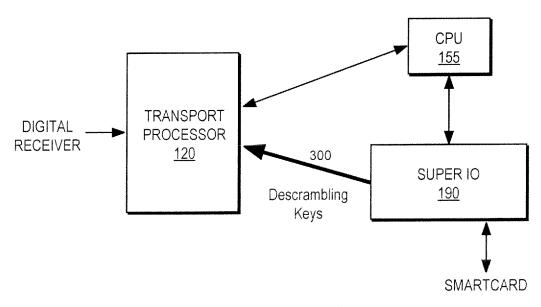


FIG. 3

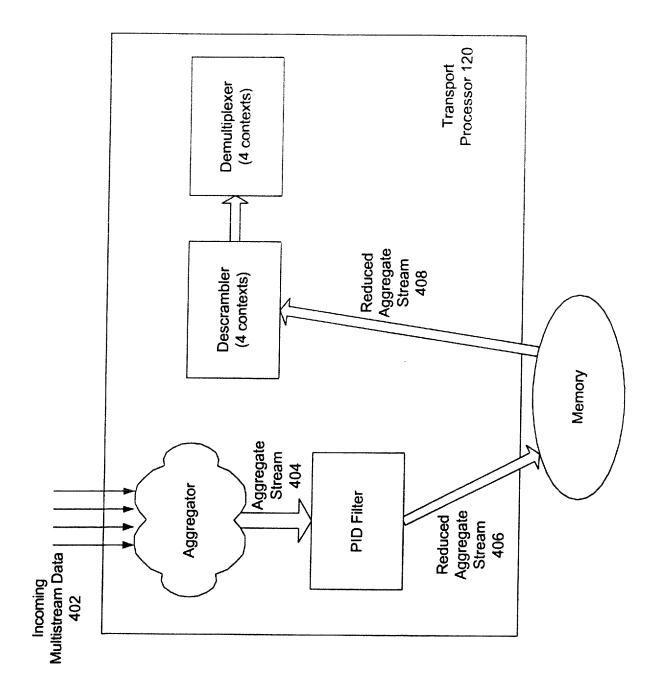


Fig. 4A

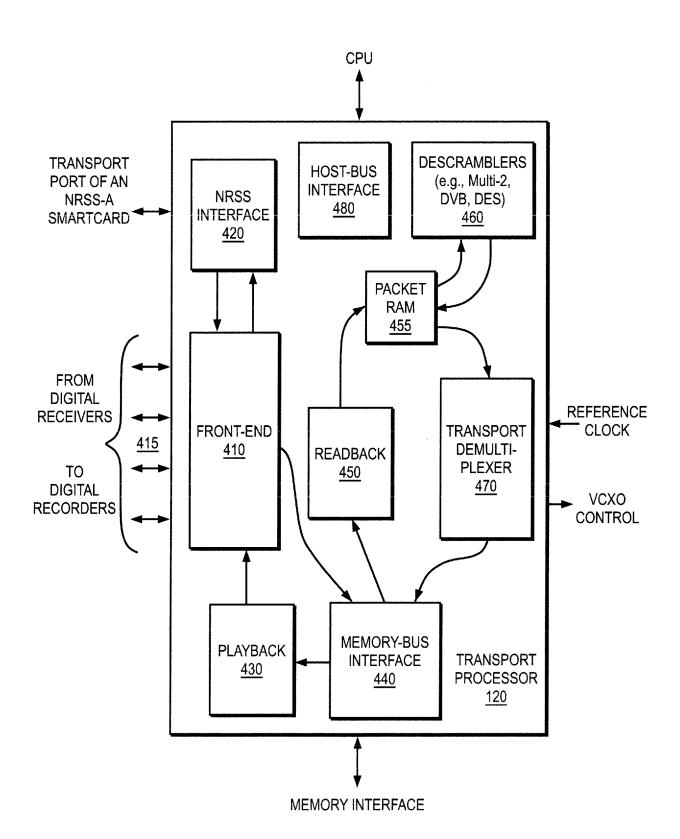


FIG. 4B

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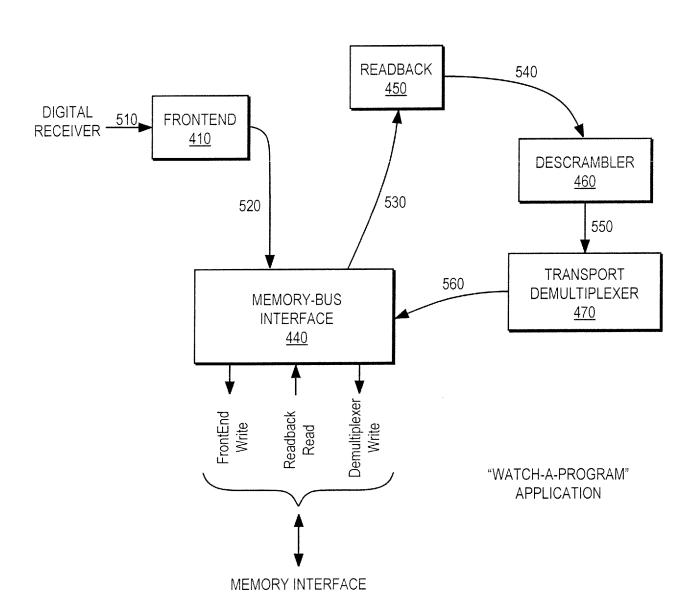


FIG. 5

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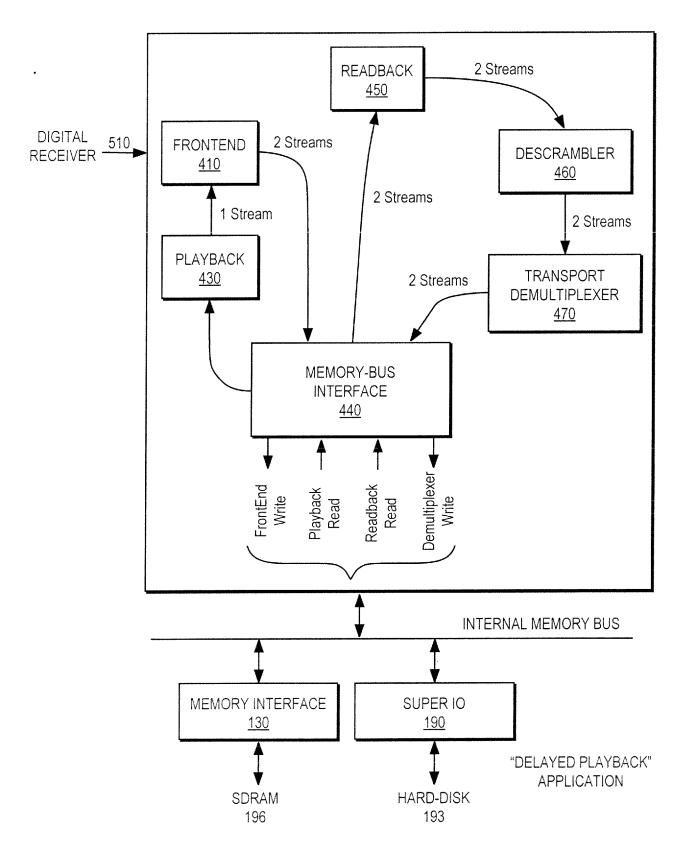
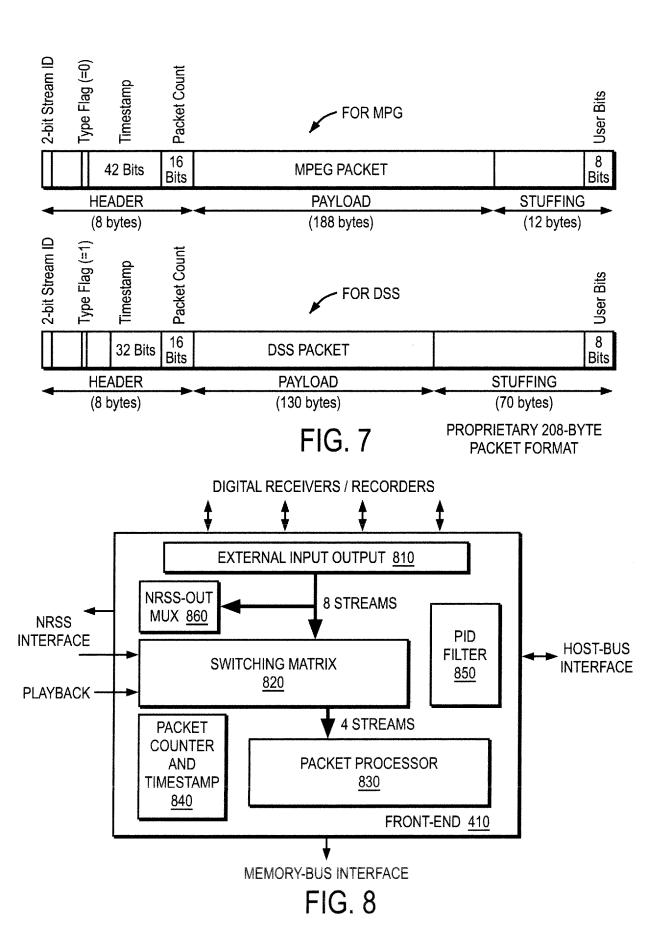
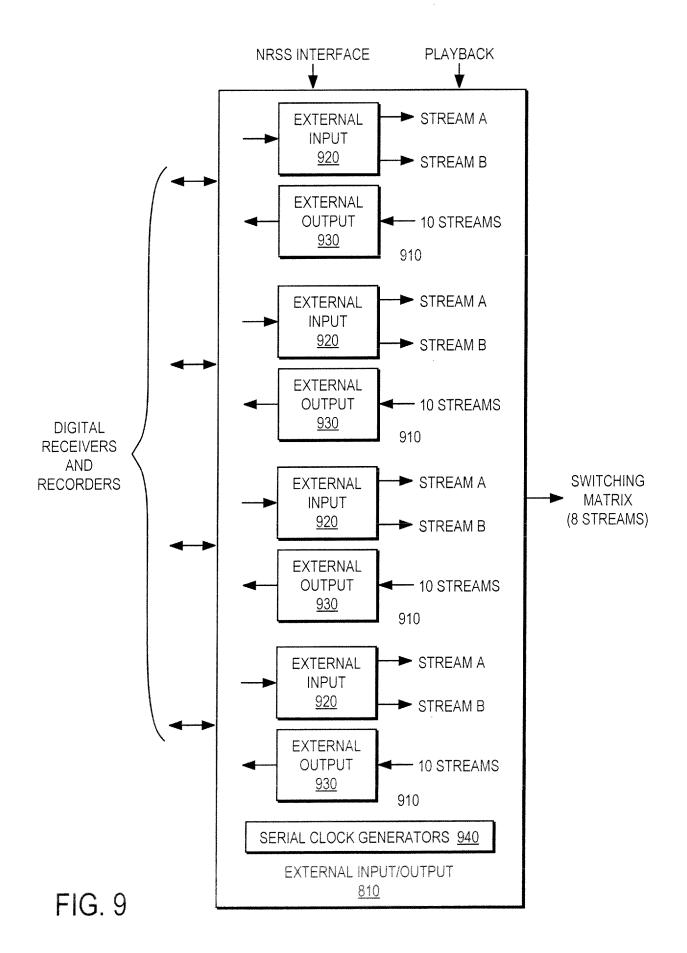


FIG. 6

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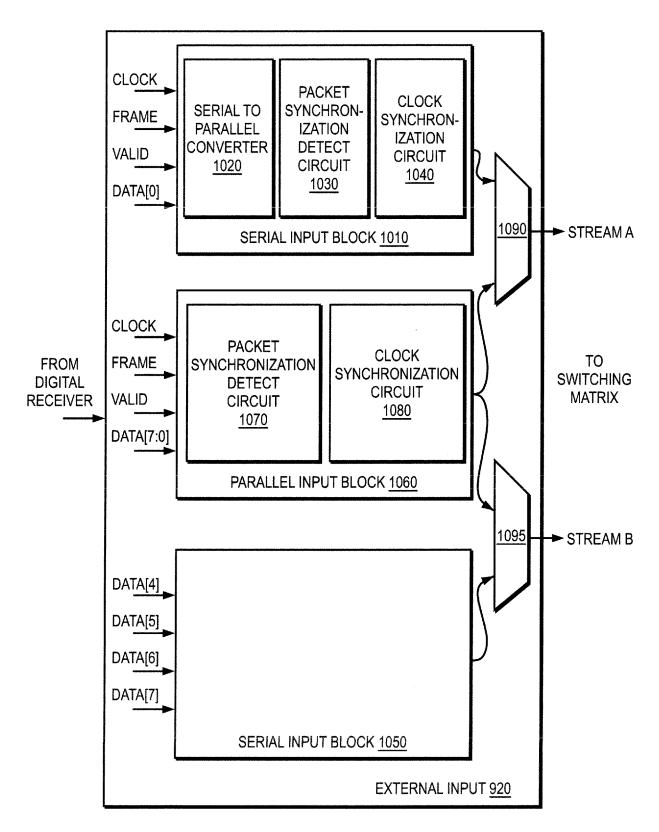


FIG. 10

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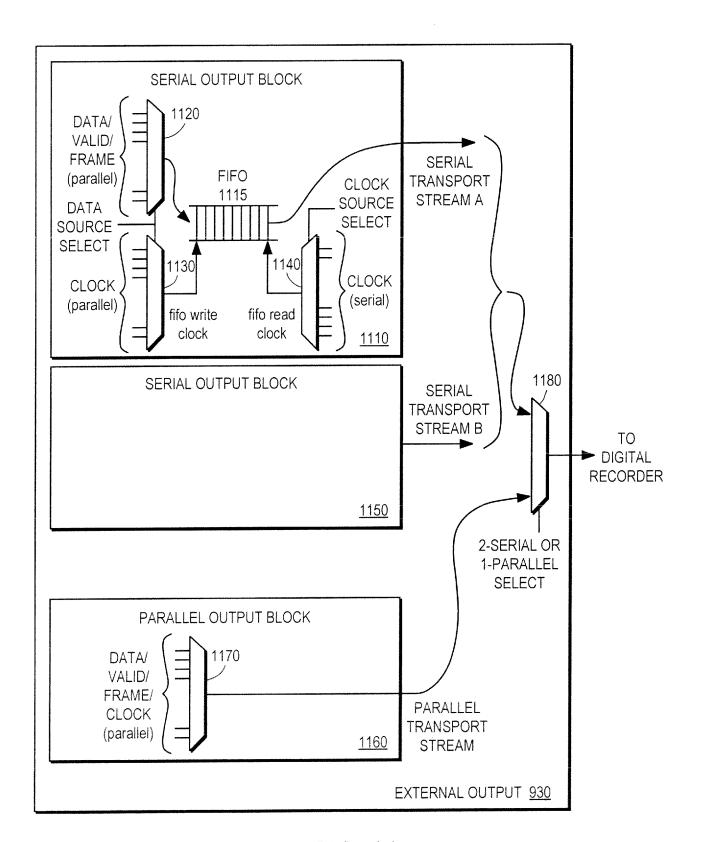
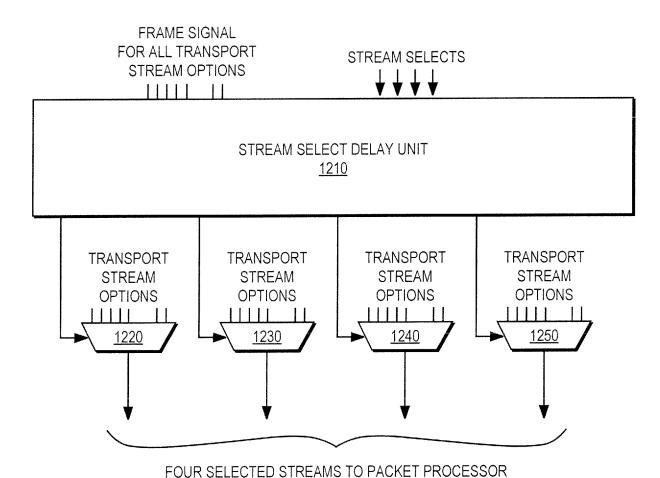


FIG. 11

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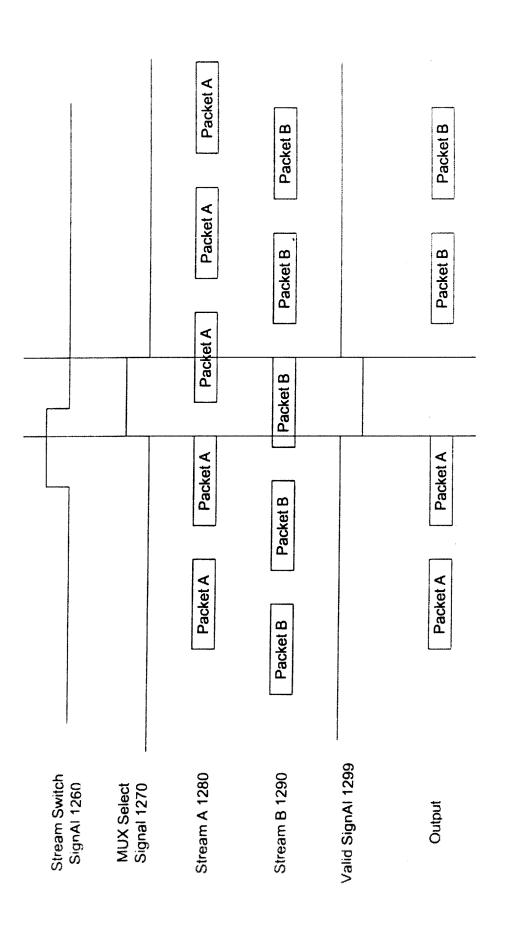
SWITCHING MATRIX

820



ON SELECTED STREAMS TO FACILITY ROSESSOI

FIG. 12A



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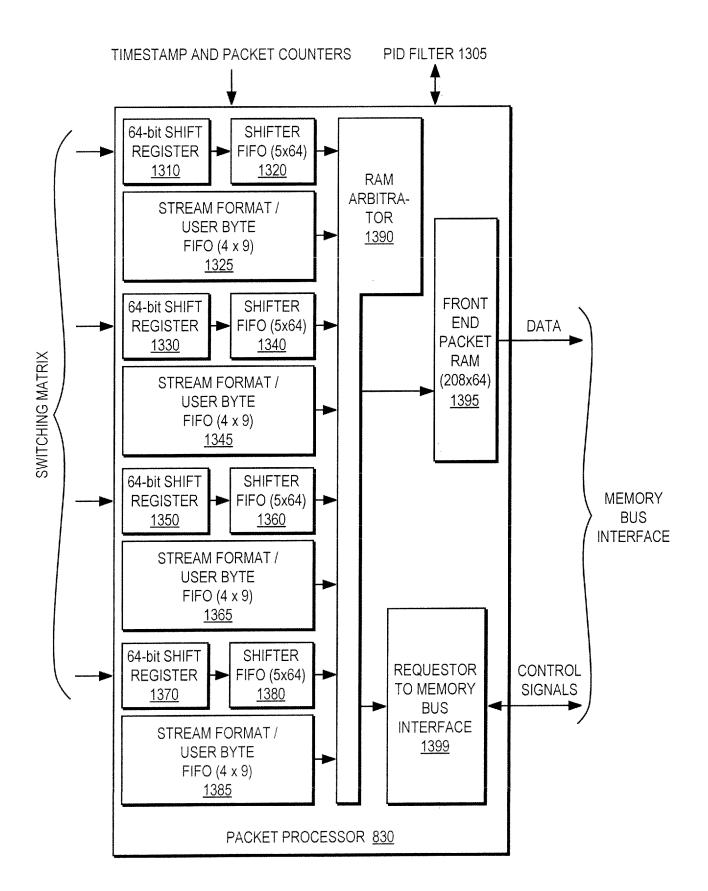


FIG. 13

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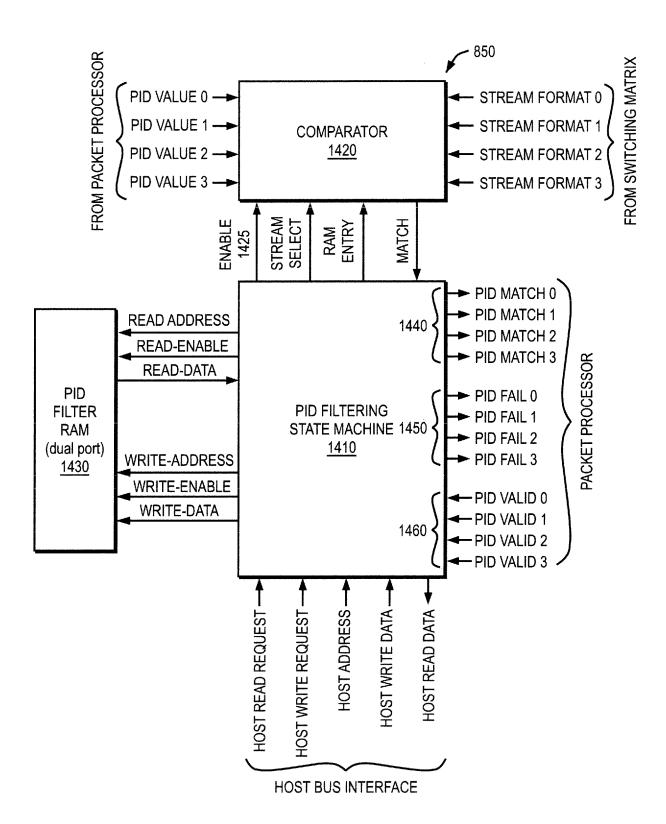


FIG. 14

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FULL TRANSPORT: PLAYBACK RUNNING AT CONSTANT KNOWN RATE

1510

PARTIAL TRANSPORT: PLAYBACK RUNNING IN TIMESTAMP-PER-PACKET MODE 1520

PARTIAL TRANSPORT: PLAYBACK RUNNING IN TIMESTAMP-PER-CHUNK MODE

= CHUNK LEAD PACKET
(typically a PCR Packet)

FIG. 15

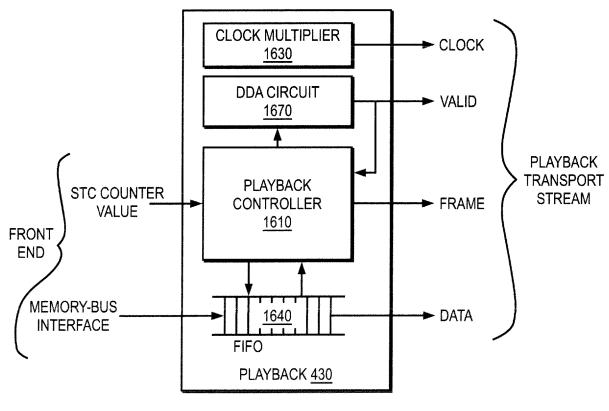


FIG. 16

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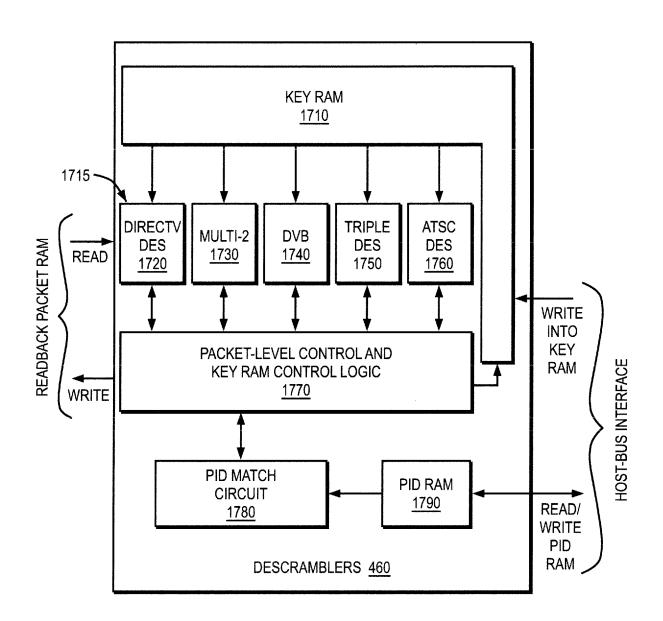


FIG. 17

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Throughput of the Descrambling Algorithms

Descrambling Algorithm	#cycles per 8 bytes	Thruput 108 MHz (in Mbps)	Thruput 150 MHz (in Mbps)	Thruput 180 MHz (in Mbps)
Multi-2	36	192	267	320
DSS DES-ECB	28	247	343	411
DVB	65	106	148	177
MPEG DES-ECB	28	247	343	411
Triple-DES CBC	72	96	133	160

Number of Streams That can be Descrambled For Different Broadcasts

<u>Broadcast</u> <u>Type</u>	Algorithm Required	Strm Rate (Mbps)	#Sturms Descr 108 MHz	#Sturms Descr 150 MHz	#Sturms Descr 180 MHz
Europe DVB*	DVB	60	1.8	2.5	3.0
Terrestrial US	Triple DES	19.4	4.9	6.9	8.2
DirecTV US	DSS DES	38.8	6.4	8.8	8.8
DirecTV Japan**	DVB	40	2.7	3.7	4.4
ARIB BS4 Japan	Multi-2	28.04	6.8	9.5	9.5
ATSC Cable**	Triple DES	38.8	2.5	3.4	4.1
Echostar US	DVB	24	4.4	6.2	7.4

^{* 60} Mbps contains close to 10 programs, out of which we would descramble 2 or 3. So the effective rate is more like 20 Mbps

Number of Streams That Can be DescrambledFor Different Broadcasts

Descrambling	#StdDefnPgms Descr			#HiDefnPgms Descr		
<u>Algorithm</u>	<u>108 MHz</u>	<u>150 MHz</u>	<u>180 MHz</u>	<u>108 MHz</u>	<u>150 MHz</u>	<u>180 MHz</u>
Multi-2	32	44	53	10	14	17
DSS DES	41	57	69	13	18	21
DVB	18	25	30	6	8	9
MPEG DES	41	57	69	13	18	21
Triple-DES	16	22	27	5	7	8

Note: For this table we assume SD-Rate=6Mbps/program HD-Rate=19.2Mbps/program

^{**} Likewise for these cases as well, a stream is packed with numerous programs, and we would descramble only a few.

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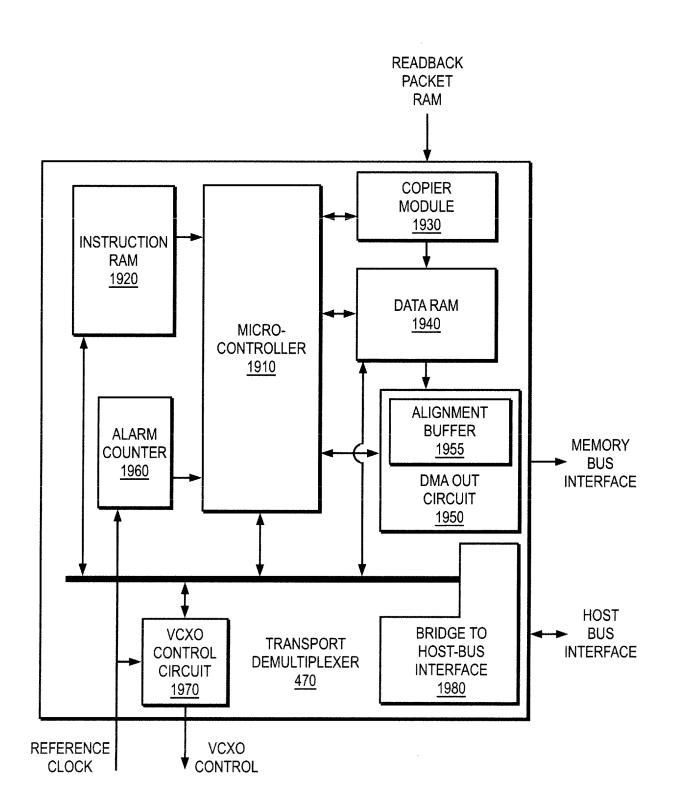
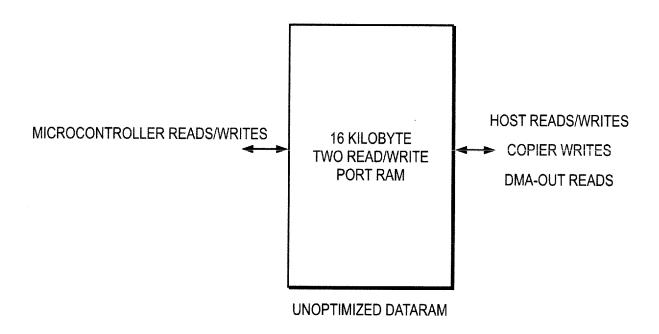


FIG. 19



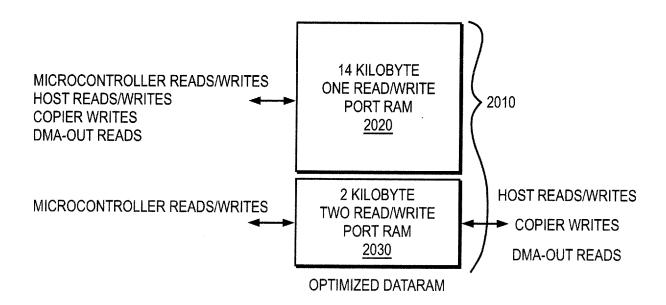


FIG. 20